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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,827	10/24/2003	Baiyi Zhao	2002B130A/2	9211

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EXAMINER
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MCDONOUGH, JAMES E

ART UNIT	PAPER NUMBER
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1755

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/01/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/692,827

Applicant(s)

ZHAO ET AL.

Examiner

James E. McDonough

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20, 27-31 and 36-42 is/are pending in the application.
- 4a) Of the above claim(s) 41 and 42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20, 27-31, and 36-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

(1) Applicant's arguments, see page 34, paragraphs 4 and 5, filed 12/18/2006, with respect to the abstract and claims 1-20, 27, 29-31, 36-40 have been fully considered and are persuasive. The rejection of the abstract and claims 1-20, 27, 29-31, 36-40 has been withdrawn.

(2) Claims 41 and 42 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 11/4/2005.

Applicant's election with traverse of species in the reply filed 11/4/2005 is acknowledged. The traversal is on the ground(s) that the species are not distinct. This is not found persuasive because applicant has not submitted evidence or identified such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case.

The requirement is still deemed proper and is therefore made FINAL.

### ***Original rejection***

(3) 6. Claims 1, 2, 5-8, 11, 12, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sumi et al., USP 6,323,353 (hereafter referred to as Sumi).

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Sumi discloses the invention as claimed when one construes the term "activator" of the present claims broadly (col. 2, 1. 56 to col. 3, 1. 50; col. 4, 1. 5, 1. 50; col. 10, 1. 20; col. 16, 1. 66 to col. 17, 1. 61, examples 14 and 15).

(4) 7. Claims 1, 2, 5-8, 11, 12, and 14-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Buchwald et al., USP 6,307,087 (hereafter referred to as Buchwald).

Buchwald discloses the invention as claimed when one construes the term "activator" broadly (col. 7, 1. 5-44; col. 9, 1. 1-42; col. 25, 1. 63; col. 31, 1. 40 to col. 32, 1. 32; col. 33, 1. 56 to col. 34, 1. 16).

(5) 8. Claims 1, 2, 5-8, 11, 12 and 14-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al., USP 6,525,210 (hereafter referred to as Zhang).

Zhang discloses the invention as claimed when the term "activator" is read broadly (col. 3, 1. 25-45; col. 10, 1. 20-65; col. 11, 1. 1-55; col. 17, 1. 60; col. 21, 1. 7-25, 1. 51-62).

(6) 10. Claims 1-8, 11, 12, 15, 16 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumi as cited above. The disclosure of Sumi has been discussed above.

Sumi lacks disclosure of prepolymerizing its catalyst, the use of a second catalyst in its composition, or the use of a support. However, each of these

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modifications would have been conventional to the routineer in the art to make with only minor experimentation. It would have been obvious to one of ordinary skill in the art to apply that skill to the disclosure of Sumi with a reasonable expectation of obtaining a highly-useful catalyst with the expected benefit of the catalyst being usable in slurry phase polymerization processes.

(7) 11. Claims 1-8, 11, 12, 14-18 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchwald as cited above.

The disclosure of Buchwald has been discussed above. Buchwald lacks disclosure of prepolymerizing its catalyst, the use of a second catalyst in its composition, or the use of a support. However, each of these modifications would have been conventional to the routineer in the art to make with only minor experimentation. It would have been obvious to one of ordinary skill in the art to apply that skill to the disclosure of Buchwald with a reasonable expectation of obtaining a highly-useful catalyst with the expected benefit of the catalyst being usable in slurry phase polymerization processes.

(8) 12. Claims 1-8, 11, 12, 14-18 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang as cited above.

The disclosure of Zhang has been discussed above. Zhang lacks disclosure of prepolymerizing its catalyst, the use of a second catalyst in its composition, or the use of a support. However, each of these modifications would have been conventional

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to the routineer in the art to make with only minor experimentation. It would have been obvious to one of ordinary skill in the art to apply that skill to the disclosure of Zhang with a reasonable expectation of obtaining a highly-useful catalyst with the expected benefit of the catalyst being usable in slurry phase polymerization processes.

(9) 13. Claims 1-20, 27-31 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of Sumi, Buchwald, or Zhang as cited above in view of Yorisue, JP-09 255713 (hereafter referred to as Yorisue).

The disclosures of the primary references have been discussed above. None of the primary references discloses the use of alkyl aluminum or alumoxane compounds as the cocatalysts for their catalysts. However, Yorisue teaches that such a cocatalyst is conventional in catalysts having a similar structure to those of the primary references when used to polymerize olefins (abstract). It would have been obvious to one of ordinary skill in the art to apply the teaching of Yorisue to the disclosures of any of the primary references with a reasonable expectation of obtaining a highly-useful olefin polymerization catalyst with the expected benefit of the polymer having a high molecular weight with low polydispersity.

***Response to arguments***

(10) Applicants ask examiner to explain what “construing the term activator broadly” means. It is the current examiners position that this reads on any Lewis acid as specified in claim 1.

Applicants argue that Sumi does not disclose activators as understood in the instant claims. Examiner respectfully submits that on column 27, lines 63-65 Sumi teaches a metal complex of a ligand with one or more metals selected from rhodium, ruthenium, iridium, and nickel. If at least two metals were selected such as iridium and nickel, one complex would read on the catalyst precursor of the instant invention and the other would read on a Lewis acid activator.

Applicants argue that Sumi does not disclose any compound that fits the word formula of claim 1 or the structural formula of claim 2 and, that Sumi does not disclose or make obvious the Y groups listed in claim 17. Examiner respectfully submits that selecting the ligand (1-1) (column 4, lines 50-55) and  $[\text{Ru}(\text{cod}) \text{Cl}_2]_n$  (column 17, line 21) as the metal reaction would produce a compound that directly reads on the structure of claim 2. The other limitations to claims 1 and 2 and how Sumi reads on them are listed above. Applicant’s argument that Sumi does not disclose or make obvious the Y groups listed in claim 17 is found not persuasive because the species biphenyl includes the binapthals.

Applicants argue that Sumi does not demonstrate what would be the results of reacting his MAP with the transition metals. As mentioned above the reaction of ligand (1-1) with  $[\text{Ru}(\text{cod}) \text{Cl}_2]_n$  would result in a compound that reads on the catalyst precursor

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of claims 1 and 2. This would occur by the strong N and P donor atoms of the ligand (1-1) replacing the weakly binding cod ligand which, is well known in the art.

(11) Applicants argue that Buchwald does not disclose activators of claim 1 and that their "additional reagents" are bases. This is found not persuasive because while Buchwald does mention adding bases, most all of the bases taught contain alkali metal cations making them Lewis acids and reading on claim 1.

Applicants argue that Buchwald does not disclose any compound that fits the word formula of claim 1 or the structural formula of claim 2. This argument is found to be not persuasive because column 25, line 55 to column 26, line 50 teaches biphenyl with a  $\text{NR}_2$  and a  $\text{PR}_2$  donor groups reacting with  $\text{Pd}_2(\text{dba})_3$  (the reference also teaches using  $(\text{CH}_3\text{CN})_2\text{PdCl}_2$  column 32, lines 24-25 which, it is clear that chelating ligands such as the derivative of biphenyl above will replace mono-dentate ligands such as the nitrile ligands on the Pd compound above to form compounds.

Applicants argue that Buchwald states that the metal should be in a zero but not the highest oxidation state. This is found not persuasive because in column 32, lines 7-8 Buchwald states "the metal center is desirably in the zero valent state or is capable of being reduced to metal(0)." Buchwald does not state that the metal has to be in the zero oxidation state.

(12) Applicants argue that does not disclose a compound with N and P atoms bonded to a metal, which further contains abstractable ligands. This is found not



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persuasive because if the metal complex  $\text{PdCl}_2(\text{RCN})_2$  (column 21, line 10) is reacted with the ligands from column 11, lines 1-55, it is clear that the N and P donor atoms would replace the nitrile ligands, forming a complex that reads on the catalyst precursor of claims 1 and 2 and having abstractable ligands.

Applicants argue that Zhang does not have substituents on the N atom. This is found not persuasive because the ligands above all have hydrocarbyl substituents on the N atom.

Applicants argue that there is no disclosure of what the compounds of Zhang would look like. This is found not persuasive because it is clear that a bidentate ligands used would chelate the metal rendering a metal that is bound to both a N and a P atom of the ligand.

(13) Applicants argue that no specific catalyst is disclosed by Sumi and, that Sumi merely suggest that the MAP ligand can be used in a transition metal complex. This is found not persuasive because reacting the metal compounds taught with the ligands taught would provide specific catalyst that read on the claims of the instant invention.

Applicants argue that there is no suggestion that the catalyst can be used for anything other than asymmetric hydrogenation. This is found not persuasive because in column 1, lines 6-12 Sumi teaches that these catalyst can be used for carbon-carbon bond formation, which is the reaction occurring during the polymerization of olefins.

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Applicants argue that one of ordinary skill in the art would not think to prepolymerize such catalyst. This is found not persuasive because prepolymerization is not disclosed in the claims of the instant application.

Applicants argue that the routineer concerned with the Sumi invention would have the ordinary skill in the art of asymmetric hydrogenation not polymerization. Examiner respectfully submits that the art is organometallic/metal organic catalysis **not** hydrogenation vs. polymerization.

(14) Applicants argue that the 103 rejection of Buchwald and the 103 rejection of Zhang are improper for "substantially identical to the obviousness type rejection over Sumi. For reasons recited in discussing Sumi under 103 it is respectfully submitted that the rejections over Buchwald and Zhang should be withdrawn". This is found not persuasive because applicants do not specifically define the problems with Buchwald and Zhang. Furthermore, examiner respectfully submits that the response to arguments above for Sumi would be substantially identical to the response to arguments for upholding the 102 rejections of Buchwald and Zhang.

(15) Applicants argue that the primary references do not disclose the use of alkyl aluminum or alumoxane. This is found not persuasive because claims 1 and 2 do not require alkyl aluminum or alumoxane and the primary references can have Lewis acids as their co-catalyst.

Applicants argue that the primary references do not disclose specific catalyst. This is found not persuasive because the instant invention also does not disclose a specific catalyst in claims 1 or 2.

Applicants argue even if the references do disclose specific catalyst none contain abstractable ligands as required in accordance with applicant's invention. This is found not persuasive because as mentioned above the references do allow for abstractable ligands.

Applicants argue that the references do not address polymerization catalyst. This is found not persuasive because Sumi and Zhang teaches carbon-carbon bond formation (critical to polymerization of olefins) and Buchwald teaches metal catalyst play important roles in polymerization.

**(16) THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

(17) Any inquiry concerning this communication or earlier communications from the examiner should be directed to James E. McDonough whose telephone number is (571)272-6398. The examiner can normally be reached on 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JEM 2/7/2007

  
**AILEEN FELTON**  
**PRIMARY EXAMINER**